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THE DEVELOPMENT OF SMALL-HOLDER IRRIGATION SCHEMES IN ZIMBABWE WITH PARTICULAR REFERENCE TO MASVINGO PROVINCE: AN OVERVIEW

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INTRODUCTION

Irrigation development plays an insignificant role in sub-Saharan Africa, except the large scale projects in Sudan and Madagascar where there is a history of irrigation by small farmers.[1] Abundance of rainfed fertile lands provides the reason why irrigation development has played an insignificant role. Prior to colonization the African peasants used to practice shifting cultivation. This practice allowed the Lands to regain their fertility, and it was practised in well watered regions. But with advent of colonialism, the peasants lost the freedom to move about. Because the colonialists' economic development was based on racial discrimination, the peasants were removed from all fertile lands and resettled in areas of poor soil fertility and erratic and unreliable rainfall. This led to impoverishment of the rural communities and ecological crisis. Therefore irrigation development in Africa in general and Zimbabwe in particular as shall be shown shortly, was not a case of "the desert shall bloom" syndrome. Rather it was a calculated response to the needs of European settlers and foreign capital.

Irrigation is important in the river valleys of Zimbabwe, Somalia, Ethiopia and Mozambique and in parts of Mali, Senegal and Northern Nigeria.[2] The origin of irrigation development in Zimbabwe dates back to our prehistory. In the Nyanga district, there are thousands of stone terraced mountain slopes, many of which were used to lead water from mountain streams to the terraces.[3] In our recorded history, however, the earliest known irrigation scheme is a small one established at Inyathi Mission in Matebeleland.[4] During 1920 to 1950, contends J M Watermeyer, there was a steady but unspectular growth of irrigation development throughout Zimbabwe and by 1950 the area under irrigation had reached 7 000 hectares.[5] The majority of these schemes relied on river flow diversion works to supply their needs but from 1950 onwards, it became clear to both government and irrigators alike that rivers were becoming fully righted and that it was necessary to venture into storage works. Wherever there was a conflict in whose rights should take priority between the settler farmer and the peasant; because of racial discrimination the peasant always lost his rights to water. L V Jowett, the Manicaland Provincial "Native" Commissioner stated that "Native" Rights refer to primary rights only.[6] He was writing to the Chief "Native" Commissioner

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complaining about water rights which had been granted to settler farmers above Nyanyadzi Scheme which jeopardized the scheme.

Irrigation development in colonial Zimbabwe proceeded on the lines of small self contained schemes on individual farms. As from I936 the colonial government adopted a more active policy of water conservation and two large dams for irrigation purposes were constructed on the Umgusa river near Bulawayo and Mushandike river near Masvingo (formerly Fort Victoria). Both these schemes were entirely government owned and water supplied for irrigation purposes. It was during the decade I960 to I970 that development reached significant proportions. This was initiated in I96I with the completion of Kyle Dam to serve some 26 500 hectares in the South Eastern lowveld for sugar production by Triangle and Hippo Valley estates.[7] There was also considerable irrigation development in the low lying African areas bordering the Sabi river where the rainfall is erratic and the growth of summer crops is therefore not normally possible without irrigation.[8] Government subsidized schemes were started in the Sabi Valley as early as I928 and have kept pace with developmentin the commercial farming areas.[9] However it is important to point out that the development of peasant holder schemes has not kept pace with development of large scale schemes in European areas. It is an interesting feature of irrigation development in Zimbabwe over the last fifteen years that this has taken place almost entirely in the better rainfall areas in the north of the country with produces 2/3 of the maize, cotton, soya beans and also irrigated wheat.

Watermeyer gives several probable reasons for the above trend. He contends that in these better rainfall areas farms are more profitable and money can be found for investment in irrigation; the infrastructure including management, mechanisation etc. Electricity supplies are closer to hand, and not least, the yield from farm dams is very much better in these areas than in drier parts of the country and that commercial irrigation companies have been involved mainly with the private farming sector.[10] This brings out the discriminatory aspect of the economic policy of the settler state and it actually reinforces the contention by P W Palmer Jones and M Rukuni (I980) that

the massive development in the south-eastern lowveld since the second world war is a coincidence of interests of the state and foreign capital and that this type of irrigation development will not meet the basic needs of the mass of black Zimbabwean in the form of capitalist wage labour or self employment as farmers.II A most recent example of this kind of development in irrigation is the Mwenezi Palm Oil irrigation project.

However, at this juncture focus shall be laid on the development of smallscale irrigation schemes in former African areas. While irrigation development in the former European areas has produced tangible results, in African areas it has dismally failed to do so. The colonial state has actually blamed the human factor as being soley responsible for the failure of the schemes to produce the intended results. Post independence irrigation development has also been riddled with problems and a large proportion of the blame for these problems have been shouldered by the peasant. Consequently, the peasant farmer involved in irrigated farming has been portrayed as a very uneconomic man, incapable of learning new production techniques. But is this a fair assessment of both the colonial and post colonial peasant irrigator? It is to this question that this thesis seeks to find an answer.

Generally speaking, seven points inform this thesis. Irrigation development in African areas is viewed by the author as;

a) The implementation of the Land Apportionment Act of I930. This act legalised the unfair distribution of land between the white settlers and African peasants which had started in I890 in a <u>de facto</u> manner. The African peasants got a small quantity of land of poor quality whose carrying capacity was very low. Therefore irrigation development was meant to enable the land to carry greater populations evicted from the designated white areas. (Yet in white areas irrigation development was meant to enable the population using the land to make more profitable use of it.)

b) It was also meant to deal with the ecological crisis that had resulted in these African areas due to overcrowding and unsuitability of the environment to the use it was put to. The I95I Land Husbandry Act failed to produce any tangible results. The State reasoned that the Act failed to yield good results due to the state's limited control of the peasant farmer. It felt on an irrigation scheme the control of the farmers would be much easier than on dry land plots, and therefore the passing on of new and better techniques of production would be much easier and faster. In fact the state's control of irrigators reduced them to state labourers.

c) Irrigation development was thought to produce a large and prosperous rural black elite whose influence in conjunction with African Purchase farmers would produce a stabilizing influence on the country's politics and extend the tax base into the rural areas. It was also thought that the prosperity of these irrigators would have a stabilizing influence on the large farm economy by lessening the demand for land in scheduled white areas.

d) After U.D.I the tempo in agricultural development is diversification of agricultural production in an effort to beat the United Nations sanctions of I966, and irrigation development was seen as a way of bringing more land into production and incorporating the peasant into cash crop production. This was achieved through the crops the peasant was made to choose from.

e) Irrigation development was also viewed as a rural development tool. It was thought that irrigation development would provide employment opportunities within the Communal Lands (formerly Tribal Trust Lands) for a large and growing population. The neo-classical theory of economic development was

applied. It was hoped that it would create real wealth on the irrigation schemes, which would overflow into the surrounding areas. This however, remained in essence a real "trickle" down of wealth. It has actually led into the process of rural differentation.

f) After I975, the tempo shifted from "development" to security consideration. Irrigation schemes became part and parcel of Protected Villages, especially in the Masvingo Province. The security forces found it better in terms of supervision of peasants working on irrigation schemes which were fenced than peasants working on scattered dryland plots.

g) I980 onwards irrigation development is again viewed as a cutting edge of development in rural areas. It is seen as a way of bringing about a transformation of peasant production. It is also seen as a way of resettling peasant farmers (Mushandike Irrigation Scheme) and as a "Land Reform" tool.

All the above points had a tremendous impact on the planning, designing, operation and performance of these irrigation schemes. The Thesis opens with a literature review on irrigation development in Zimbabwe.

LITERATURE REVIEW

Smallholder irrigation schemes have been a subject of study by quite a number of scholars. W Roder (I965) gave a good historical survey of the development of smallholder irrigation schemes in Manicaland. He concluded that the development of irrigation projects was seen as an effective means of implementing the Land Apportionment Act of I930.[I2] N Reynolds (I969) who studied thesocio-economic aspects of Nyamaropa irrigation scheme also in Manicaland echoed the observations of W Roder. He stated that there were two phases in the history of African irrigation in Zimbabwe; the first phase being implemented in the I930's and I940's by the colonial regime and was aimed at providing a source of food in areas frequently hit by drought and the second being aimed at providing settlement areas for African's removed from European areas in the I950's under the implementation of the Land Apportionment Act[I3] Reynolds also touched on the fundamental issues of the development of peasant farmers. He highlighted the short-comings of the colonial state in its approach to the development of the peasant farmer. The colonial state believed that changes in character are prerequisites for development and this led the former into blind alleys of theory and action.[I4] He contended that the environment within which an individual social and economic activities take place can be altered in certain selected aspects which are relevant to the learning of new behaviour. He discounted personality changes becoming significant until an institutional change suddenly eliminates former barriers and creates new economic opportunities.[I5] O Cluer who also researched on irrigation schemes in African areas noted that irrigation schemes for africans although attempting to provide answers to population pressures and environmental constraints by introducing new technology imposed organisational forms which necessitated changes in behaviour patterns and relations. She went on to state the life of farmers on irrigation schemes was largely ordered from outside.[I6] Consequently, she argued that, these schemes must be seen as a forced form of self-sufficiency for certain areas in which the generation of African based organisation was actively discouraged.[I7] She concluded that the problems and short-comings of irrigation schemes run by the then Ministry of Internal Affairs seem merely to have been compounded by the operation under a statutory body run on private enterprise lines.[I8]

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The pattern seems to have been set to incorporate the African peasant farmer in the development of the then Tribal Trust Lands mainly in the form of labour. A K Weinrich (I975) points out that many peasant farmers saw irrigation schemes as a means to accumulate some savings with the objective of becoming master farmers in the then African Purchase Areas.[I9] She supported the colonial state's running of the lives of peasants on the schemes on the grounds that when changes have to take place within a short time and private capital and skill is lacking, government must direct and guide these changes.[20] However, she points out that though irrigation schemes increased in number, they did not become popular with the peasant farmers and most of the schemes had vacant plots. The reasons are, according to her were various, chief among them were the lease conditions which lay many burdens on plotholders but granted them few rights.[2I]

A J B Hughes (I974) gave a comprehensive study of these schemes at a national level. The keynote in his study is government policy towards these schemes. He contended that technical considerations led initially to gradual increasing official involvement in the day to day running of the schemes. Developments during the period I936 to I957, he argued, led to increasing technical sophistication which encouraged the assumption that a certain amount of management of schemes by government officials would always be required.[22] He went on to state that there had definitely been a growing preoccupation in official circles with the need to make the schemes more productive. This had b been coupled with an increased acceptance of the view that higher productivity could only be achieved through more intensive management of these enterprises and the abandonment of several basic principles which underlay previous irrigation policy.[23] M K Munzwa (I98I) illustrated the role of small scale irrigation development with special reference to Masvingo province. He also highlighted the serious lack of economic infrastructure for most the schemes in the province. Lack of transport facilities, he argued, was one of the major problems prohibiting the effectiveness of these irrigation schemes as a rural development tool. The most recent study is by M Rukuni (I984) who highlighted economic and institutional factors affecting irrigation development in Communal Lands. His study is very comprehinsive and is at nation level.

STUDY AREA

In order to effect a critical discussion of the seven points earlier on raised in the thesis, the author has chosen the province of Masvingo.

a) Rationale behind the author's choice of Masvingo Schemes

The author's choice of Masvingo schemes has been underlined by the following facts.

i) Manicaland schemes have been studied by many scholars, to date only M K Munzwa has studied Masvingo schemes. Therefore the author hopes that his study will contribute more knowledge to irrigation development in this province.

ii) Masvingo is the only province at the moment which has had a new schemes initiated after independence (Mushandike 1981). Therefore, it provides the author with a chance to compare policy - colonial and post colonial to assess whether there is change or continuity.

iii) Masvingo province to a great extent lies in regions IV and V, which are suitable for extensive livestock production. The province has very erratic and unreliable rainfall making it an ideal environment for irrigation development.

iv) The province is the only one which had protected villages which were planned in conjunction with irrigation schemes during the liberation war.

v The province has the best infrastructure for irrigation development. Water conservation works in this province are at high level. (Kyle Dam, Lake MacDougall, Bangala etc. Yet schemes in this province always suffer from critical water shortages. Therefore it provides an opportunity to study the political economy of water use in Zimbabwe, whose interests come first, the peasant's or capital's

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b) Land Apportionment Act at National Level

> "the dominant theme of Rhodesian agricultural history is surely the triumph of European over African farmers"[24]

The range of policy instruments utilised by the colonial state to achieve this "triumph" included physical and political coercion of African peasants, legislative discrimination and a host of direct economic measures designed to disadvantage the indegenous farmer vis-avis the settler farmers. Of particular importance to this study is the Land Apportionment Act of I930 which necessitated irrigation development in African areas.

The I930 Land Apportionment Act established segregationism in land distribution in a de jure manner. This segregation had started in I890 and continued up to I930 in a de facto manner. The Act distributed land between the two races unequally. The inequality was not only in quantity but in quality as well. The table below demonstrates the unequal distribution.

LAND APPORTIONMENT ACT IN SOUTHERN RHODESIA I930

Category	Acres	% of Country
European Area	49 I49 I74	5I.0
Native Reserves	2I I27 040	22.0
Unassigned Area	I7 793 300	I8.5
Native Area	7 464 566	7.8
Forest Area	590 500	0.6
Undetermined Area	88 540	0.6
Total	96 2I3 I20	I00.0
Total for African use	28 59I 606	29.8

Source: H V Moyana: The Political Economy of Land in Zimbabwe p.70

Zimbabwe is divided into Natural Regions I to V in order of decreasing agricultural potential. Nearly 75% of the Communal Lands lie in Natural Regions IV and V and are in areas receiving less than 700 mm of unreliable rainfall.[25] The soils in these regions (IV and V) in most cases are sandy, acid and of relatively low agricultural potential. The table below shows the inequality in quality of land between European areas and African areas.

Land Distribution by Natural Region

Region	Commercial Farming (ha)	Communal Lands
Natural Retion I	400 000	I28 000
Natural Region II	4 325 000	I 255 000
Natural Region III	3 240 000	2 8I5 000
Natural Region IV	4 026 000	7 307 000
Natural Region V	3 648 000	4 774 000
Total	I5 639 000	I6 279 000

Source: Adapted from Whitsun Foundation (I983) cited in M Rukuni: An Analysis of Economic and Institutional factors affecting irrigation development in Communal Lands of Zimbabwe p.28.

Consequently, the Land Apportionment Act created an artificial shortage of land in African areas. This is evidenced by the report of Irrigation Policy Committee of I960 when it stated that:

> There is plenty of land in Southern Rhodesia to enable all those who want to make a living from the soil to do so at advancing living standards without the need for subsidized irrigation. But a lot of this land is not accessible to Africans and there are segments of of the African population settled in areas where present systems of land use are either inadequate to afford reasonable advancement in living standards or are likely to result in the deterioration of natural resources.[26]

The Land Apportionment Act, coupled with the effects of other Acts, resulted in landlessness unemployment and underemployment and low incomes among the African peasantry. The Phillips Report Committee emphasized that agriculture would remain the major industry. It reported thus:

> A reduction in poverty relatively widespread in the Tribal Trust Areas - depends largely upon the raising of the productive efficiency of the pastorists the cultivators and those engaged in simple mixed farming. It is imperative that their employment should be brought about as rapidly as possible because otherwise migration of rural inhabitants to the towns will be accelerated.[27]

Prior to the passing of the Act, African peasants practised mixed farming on the highveld which fell within Natural Regions I and III. The land allocated to African peasants was not compatible with the African way of life viz agricultural production.

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The lands they were allocated were suitable for extensive livestock production. Given the inadequate land allocated, overpopulation problem did not take long to surface. Agricultural production also started to decline. The colonial state responded to this desperate situation by passing the Native Land Husbandry Act in 1951. The colonial state believed that failure in the "Reserves" was not a case of inadequate land but a clear case of poor husbandry. The colonial state decided to turn a blind eye to the real causes of such a sorry state of affairs in the "Reserves".

c) Impact of the Land Apportionment Act on Masvingo Peasantry

Phimister describes the Victoria district, which is part of Masvingo province, as a comparatively heavily populated, suitable for extensive grain production and was ideally situated to take advantage of the market opened when mines in the Shurugwi area began production in 1898.[28] The expanding demand for grain of the Selukwe mines was readily met by the Victoria peasantry and this was gradually having the effect of placing natives ... on the high road to prosperity.[29] But this prosperity was short lived due to the effects of the Land Apportionment Act which as earlier on indicated legalized the unfair distribution of land. R Mutwetwa states that in the period 1914-15 Murinye Reserve was surrendered to European occupation and that the Nyajena reserve was transferred from Ndanga district to Victoria district; then thereafter the land was appropriated for European occupation.[30] Part of Chikwanda Reserve in Victoria District was again appropriated for European occupation and was never replaced.[31] Shumba's Reserve formed only 1/6 of the whole of Shumba's Mushawasha original country. Murinye Reserve was very hilly and there were not more than 7 000 acres of land fit for cultivation.[32] In the Mugabe Reserve there were not more than 2 500 acres for cultivation.[33] The Chief Native Commissioner had thought as necessary to allocate 15-20 acres of arable land to each hut in mountainous areas:

> In some cases reserves appear unnecessarily large but this is accounted for by the fact that they have had to select ground interspersed with granite and ground unfit for cultivation.[34]

In his report on Ndanga Reserve, Bazeley said that a quarter of the land was granite rock, useless for cultivation. Moreover the soil on the greater part of the reserve was very sandy and thus quickly worn. Very little of it could be cultivated for more than 2 years in ten.[35]

As a result of this unfair distribution of land, which had been set in motion since I890 and legalized by the I930 Act, poverty among peasants did not take long to surface. As early as I9I2 and I9I6 the colonial state had to distribute grain as a result of famine in the peasant areas. In short, this was the state of affairs in the peasant sector of Masvingo province.

IRRIGATION DEVELOPMENT IN MASVINGO PROVINCE

Peasant small-holder irrigation development dates back as far as I96I when Chilonga irrigation scheme was constructed. Next to be developed was Mapanzure in I968. Musvuvugwa, Banga, Mapanzure, St Josephs, Gudo Pools, Muteyo, Tshovane, Runangwana and Manjinji were developed in the I970s, while Mushandike was developed in I98I.

These schemes were developed to supplement dryland cultivation. When Chilonga was first opened in I96I, selection of the plotholders on the scheme was done by the District Commissioner of Mwenezi formerly Nuanetsi. The local people of Matibi II Communal Lands were given the first preference. The response of local people to the scheme was very poor therefore people from other districts were invited to join the scheme. According to M K Munzwa a number of factors contributed to this. There was no shortage of land in the area.[36] This is still true. The area up to the present is characterised by sparse population and their dryland holdings are very big averaging 6 acres. The most important factor that must have more or less repelled local people from joining the schemes was the fact that it was imposed on them.

Schemes in other district such as Chibi and Victoria in terms of local people involvement and development have been the most successful. According to M K Munzwa at Banga irrigation scheme

81% are local people and only I9% foreign at Muteyo 39% are local and at Chilonga I7% are local people. At Makonese 92% are local residents.[37]

With the exception of Makonese irrigation scheme which is served by a dam all other schemes depend on river flow diversion. They do not have water storage facilities. Most of the schemes in their early stages had earthen canals which led to lot of wastage of water through seepage. These unlined canals have a high labour demand for maintenance, which the irrigators usually failed to meet. Some of the schemes have problems because of the inadequacies of the canals. At Chilonga section 3 plotholders complained of insufficient water supply, which is largely due to the narrowness of the supply canal. All these schemes are loaded with faulty technical design due to the fact that they were regarded as temporary measures to deal with population pressures in the African areas.

The Water Act of I927 attached water rights to land ownership This meant that African farmers on the communally owned land, could not own water rights. For these small schemes, water rights belonged to the relevant District Commissioner. All the irrigation schemes have no security of tenure. The irrigators simply have user-rights leases which entitle them to till the plot as long as they do not violate their rights and also manage to pay their water rates. This creates a sense of insecurity and has adverse effects in that their land inputs may be minimal. This was the case at Banga and Repangwana irrigation schemes.

Chilonga plotholders have the largest plots averaging I hectare. All other schemes are characterised by the 0.I hectare plots. All the plotholders also have dryland plots. This has affected their performance both the irrigation plots and dryland holdings. Mushandike is the only scheme where plotholders are required to give up their dryland plots and become full-time irrigation farmers. The plotholders are also required to be unemployed. The plot size at this scheme is I.5 hectares. They are expected to farm as small-scale commercial farmers.

All the schemes have not performed to the economic levels expected by the authorities. This has been so due to a variety of reasons. To effect a critical analysis of the performance of the schemes the study has been divided into sections dealing with a particular aspect of the schemes.

Irrigation Policy

Irrigation policy as earlier on pointed out, was designed to tackle ehe effects of the Land Apportionment Act of I930. In a typical policy statement, the Ministry of Internal Affairs said that the Ministry's policy was to place as many people on as little land as possible where they could make a good living.[38] In an editorial in the African Times, the colonial state wrote

> Sengwe Tribal Trust - In this area, on the Limpopo River is the Groote Vlei. Here our travellers found rich, alluvial soil on which it is planned to grow rice. Enough rice could be grown in this area to su supply all of Rhodesias needs. Next year a start would be made to irrigate the area. More land again for the Africans.[39]

The Ministry of Internal Affairs Circular No.85 laid out a broad policy objectives of irrigation schemes in African areas. According to this circular the objectives were

a) to provide locally grown food within Tribal Trust Lands concerned and so avoid wasteful expenditure in connection with the movement of food into the area from outside.

b) to provide employment opportunities within Tribal Trust Lands for large and growing population;

c) to create real wealth on the irrigation schemes; a wealth which will overflow in to surrounding areas.

d) to rationalize land use by making it unnecessary for tribesman to open up huge areas of arable or dry land crop production in regions where this practice is inappropriate.

But it is important to note that irrigation policy failed to meet the above objectives. There were 56 schemes by I974 that were maintained by government totalling 6 I65 hectares. Only 3 78?,26 hectares (6I.3%) were actually utilized.[40] N A Hunt stated "We have long known that our irrigation schemes are not as popular as they ought to be."[41]

This lack of a 100% utilization of the irrigation schemes was accounted for according to the colonial authorities by the fact that the African's approach to continuous effort is erratic, "he has set a very high premium on his leisure. He will exert himself for only as long as he wants something and having acquired that something he is contented to sit back until his next need is sufficiently attractive to make him stir himself."[42] It was also noted that if the approaching rains are good, one could confidently forecast an exodus from the schemes, like the Civil Service irrigation schemes are only attractive in hard times.[43]

The failure of the irrigation policy to meet the aspirations of the colonial state must not be blamed on the peasant but rather in the colonial states approach to the whole concept of irrigation development in African areas.

Irrigation policy did not change much with the advent of independence in I980. The Policy Paper on Small scale irrigation schemes of I983 sets out the government's policy objectives:

a) To serve as food security in grain deficit areas of the country where a decent crop harvest is achievable every 4-5 years.

b) To reduce the inter-regional movement of grain in food deficit areas where transport costs are exorbitant.

c) to utilize suitable available resources through the maximization of a limited water resources for the benefit of communities and individuals.

d) To provide productive employment opportunities for communities living particularly in the drier regions of the country through irrigation.

e) The overall objective is to supplement dryland agriculture and therefore "Comma plots" can be justified.

The above objectives are for supplementary schemes. All other schemes are:

to encrease agricultural production (food and industrial crops) to meet the needs of a growing urban and rural population and industrial sector.

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The overall task of the schemes is outlined as that of transforming the people and their rural environment by creating conditions for

a) The development of physical resources of the community and and extending the community's control over its physical socio-economic and political environment to overcome poverty, dependency and underdevelopment.

b) Developing human resources through irrigation training and education to enable farmers to adopt new techniques, improve skills and acquire new values and goals.

Mushandike irrigation scheme represents the second category of irrigation development. It shall be assessed how succesful the post colonial irrigation policy has succeeded to meet its objectives.

Administration of the Schemes

Different government agencies have been responsible for the schemes in the past. During the period I932-I944, the agricultural staff of the Ministry of Internal Affairs was responsible for both extension and management functions at the schemes. From I945 to I963 management was vested with internal Affairs Administration whilst extension was the responsibility of the agricultural staff. Then the years I964 to I968 saw these schemes under the Department of Conservation and Extension (Conex) in the Ministry of Agriculture where extension and management was under one roof. The schemes were transferred to Ministry of Internal Affairs in I969 until I978.

Under this arrangement the District commissioners were responsible for management whilst the agricultural staff provided extension. In I978 the schemes were transferred to the Ministry of Lands, Resettlement and Natural resources under the department of Agricultural Development (Devag) Devag was responsible for both extension and management aspects of minor schemes in communal areas.

With the merger of Conex and Devag in I98I to form the Department of Agricultural, Technical and Extension Services (Agritex) under the ministry of Agriculture, the responsibility forthe schemes was handed over to the new department of Rural Development (Derude) in the Ministry of Lands, Resettlement and Rural Development.

Derude retained the management functions at schemes whilst Agritex is responsible for extension services. The split in functions and responisibility between various government departments has historically had an adverse effect on the performance of these schemes. Co-ordination of the departments and their co-operation has been poor or inadequate. Staff of the departments have been confronted with the problem of divided loylties. Personality clashes between management and extension staff at some schemes have not helped matters either.

In I985 the Ministry of Lands, Resettlement and Rural Development was merged with the Ministry of Agriculture. This had the effect of bringing both the management and extension work of the scheme under one orgainisation, Agritex. This has to some extent improved the running of the schemes since there is now good co-ordination.

There is at least one full time extension assistant at each scheme who provide the plotholders with the required technical knowledge. These extension assistants work in conjunction with an Irrigation Committee which is selected by the plotholders. These irrigation committees since I980 have been responsible for the selection of plotholders, maintenance of discipline on the scheme and collection of maintenance fee, but as from last year (I986) they were stripped of this duty of collecting maintenance fees by Agritex. The various irrigation committees are represented at provincial level. The provincial irrigation organisation is known as the Batanai Masvingo Irrigation Association.

Water Rights and Rates

As already indicated the Water Act of I927 attached water rights to land ownership, this meant that peasants in communally owned areas could not and up to now cannot own water rights. All irrigation schemes in African areas had their water rights vested in the District Commissioner. It is important to note that the I898 Order in Council Section 8I; stipulated that:

> The Company shall from time to time assign to the Natives inhabiting Southern Rhodesia land sufficient for their occupation whether as tribes, or portions of tribes, and suitable for their agricultural and

pastoral requirements, including in all cases a fair and equitable proportion of springs and permanent water.[44]

But this "fair and equitable proportion of springs and permanent water" was never observed. In the uplands where most rivers have their sources, big commercial farms owned by the settler Europeans own a lot of land tied to water rights as well as many private dams, weirs and so on, financed under the Land Bank and later Agricultural Finance. Since these are invariably in the upper reaches of public rivers upstream of communal lands, it complicated any strategy of reallocation of water rights without changes in the land ownership system. A change in theland ownership system would have entailed the repealling of the Land Apportionment Act. Even up to now the issue of water rights reallocation is stilla problem.

In Masvingo Province, the Sabi-Limpopo Authority has exclusive water rights. Rivers such as Sabi and Lundi are sources of water supplies for communal schemes such as St jJoseph's, Rupangwana and Chilonga as well as ARDA estates at Chisumbanje. When the flow of Sabi Rivers becomes very low and dissected by sand dunes, ARDA bulldozers dam the river to get as much water as possible at the expense of Communal Schemes downstream which do not have such facilities to dam up the flow.[45] To further complicate the issue, these communal schemes rely on diesel pumps to draw water from the river. They often run out of diesel before the Ministry of Water Development brings in more diesel. The engines often break down at critical periods of irrigation and weeks erupt before they are repaired. Only Chilonga uses electricity driven pumps. Therefore most communal irrigation schemes have water shortage as a major problem. Rukuni echoed this observation (I984).

Plotholders are expected to pay what the colonial state called a water rate, which is now referred to as maintenance fee at the end of each year. This water rate or maintenance fee is fixed. The problem with such a fixed rate is that it leads to inefficient use of water. Volumentric charges have been acknowledged as superior to fixed charges in reducing water in many specific instances. The major serious weakness in using a flat rate charge based on the area to be benefited or expected to be benefited is that although

the fixed charges are simple to calculate, they lead to waste of water and to contradictions between benefits and burdens.

In particular, in the absence of an enforceable non-pricing method of water allocation, the interests of upstream and downstream users tend to conflict. At Mushandike irrigation scheme, plotholders at the head of the canals use to many siphons so much that those at the bottom end do not receive adequate supplies. What this has meant in practice is that the Agritex field workers have to be present to surpervise the watering of plots to make sure that fair distribution of water is adhered to. The Gezira scheme in Sudan also has this problem. At Nyanyadzi irrigation scheme, plotholders in Section D receive less water due to inefficient technical design but are expected to pay as much as plotholders in Section A.

Often the putative beneficiaries express little concern for project maintenance and allow or cause the channels to become clogged or silted up. This is particularly a problem in the lower reeches. At Rupangwana irrigation scheme, this was quite evident.

Conseuently many ploholders have shown a lot of resistence towards the payment of maintenance fees. They feel they are not getting their money's worth in terms of water supply. This resitence accounts for the removal of the duty to collect such fees from the Irrigation Committees to Agritex officials. Typical peasant sentiments over the collection of water fees in Masvingo run like this; "Why should we turn over any water fees for water conservation projects built by the masses themselves? especially when water supplies are not forthcoming during the period when water is critically needed"[46] "By making us pay heavily for water, they increase our farming costs and place a greater burden on us especially when the fact that we cannot turn our produce all that easily into cash because there is no transport and marketing facilities"[47], retorted another plotholder.

If only water could be delivered promptly upon demand and the authorities could assure the plotholders of a market, then water fees would be paid without problems. Because the above mentioned issues have not been seriously addressed to certainly payment is more assured if it is collected by the normal governmental extraction apparatus.

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Plotsize and Labour Requirements

Most irrigation plots are traditionally small, normally 0.I hectares due to the nature of the role these irrigation shemes were assigned to play - supplementing the dryland cultivation. Therefore the authorities did not consider any plots bigger than this. Those fortunate plotholders who have plots larger than 0.I hectares only got them because initially may peasants were reluctant to get onto these schemes due to their lack of security of tenure and the uncertainty that surrounded them. Therefore the plotholders who registered good yields got more plots. This explains the reason why the plots at Chilonga irrigation scheme are bigger than anywhere else except Mushandike. The other reason why irrigation plots have remained traditionally 0.I hectare is that with irrigation schemes with large plots, this would have meant that agricultural settlement would have been able to assist a fewer poor rural people than would otherwise be the case. It would have defeated the settler state's objective of over population relief and the settling of as many people as possible on small pieces of land.

The fact that these schemes are supplementary with the exception of Mushandike, they have raised some problems at the level of labour. Because initially, the plotholders were not allowed to grow winter crops, it meant that the irrigation season coincided with dryland cultivation. This has led to the division of the family to cater for both the dryland and irrigation plot. Because many plotholders who have 0.I ha plots get very little returns from such plots, they are regarded as second to the dryland plot where the plotholder is free to grow what he deems fit. On irrigation plots for various reasons ranging from political, through economic and social as well as the need of disease control, plotholders do not have the choice of what to grow - they are told what to grow. Consequently women and very often children are sent to work on irrigation plots. The men remain tending the dryland fields and minding their livestock.

The irrigation plots have added to the activities of a small plotholders family. In most cases irrigation is not a traditional way of farming for peasants in Africa and this has meant that irrigated cropping comes in as a new- sub system. This has called for a lot of attention

of the plotholder - in some cases as at Makonese, dryland fields have suffered because plotholders spent most of their time on the plots. The reverse is also true where when there are good rains irrigation plots suffer because all labour is directed at the dryland plot. Irrigation plots have upset the original farming system rather than improving it. With its demanding land and labour requirements the irrigation development has had adverse effects on other sub-systems which are defined as the sum of the activities of a holder's family undertaking to satisfy their needs. These activities could be multi-dimensional and can be either productive or consumptive. They are unseparable and mutually complementary sub-systems of the whole farming system, all dependent on or contributing to the same family resources. Irrigation cropping has not benefited the people concerned because it has called for extra labour and financial resources.

The plotholders who have large plots have faced labour problems. The colonial state allowed them to have large plots because they made a very wrong assumption that the plotholders' children would always stay with them and provide labour. The result has been with the passage of time, that the plots have become too big for the family labour force to exploit. The situation has been worsened by the changing structure of the family labour force influenced by the following factors: as the farmer's incomes have increased (and they have over time) they and their wives have tended to withdraw their labour from farm operations. They have become shopowners at the local business centres. Rupangwana scheme is a good example where two of the plotholders now have shops at the local business centre. These plotholders work as shop assistants; as agricultural prosperity outside the schemes increased with independence, less outside labour has become available for hire. The withdrawal of parental farm labour because of higher incomes or advancing age, has not been replaced by that of farm children (which the planners may have expected) for two reasons;

i) the well-known fact that the expectations of young rural people are bound up with urban employment and

ii) the widespread phenomenon on peasant farms in Zimbabwe, that the farmers will not pay their children the going wage for work done on the family holding - a fact which is deeply resented by farm children.

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Therefore irrigation development has produced labour problems and the seasonal shortage of labour due to schooling days has compounded the problem.

Crops and Credit

Initially, when the schemes started operating, maize was the dominant crop being grown as summer supplementary crop. But with the changing philosophy of rural development, from that of supplementary activities to the concept of growth points, cash crops began to assume a lot of importance on the schemes. The scale of the schemes became an influencing factor in crop selection since crops that can only be profitably grown at a large scale such as cotton, cannot be meaningfully grown under the "comma one" plot system like that of Rupangwana, Muteyo Gudo, Mapanzure, Musvuvugwa, Banga, Chilonga etc. Mushandike Irrigation scheme only can afford the production of cotton, wheat or barley, since the plots there are $1\frac{1}{2}$ hectares. Because these schemes except Mushandike are beleagured by water shortage problems crops such as wheat, which has been grown at Makonese cannot be successfully grown because they have a high water requirement in their early stages of growth.

The most common crops produced by the plotholders are green-maize, beans and vegetables. Consideration of disease and pest control has seen irrigation committees enforcing the production of a single crop on all irrigation plots per season, either maize, beans or tomatoes. But this uniformity although desirable has led to problems at marketing level. Since the markets are local and very small production of a single crop say tomatoes has led to a glut and depressed prices so much that the plotholders have not been able to sell all their produce. This has forced various schemes to stagger deliberately their planting programmes for each season's crop so as to maximize the often limited market, Chilonga, Banga, Makonese, Mapanzure being examples. In some cases at one scheme different crops have been grown during one season.

During the colonial period plotholders had problems in getting credit for agricultural production. Even up to now its quite a considerable problem for a plotholder to get a loan from A F C. A typical policy statement on credit facilities for the peasant farmer by the colonial state read in part;

> Loans to African peasant farmers, and irrigators are more than trouble than they are worth. In his culture the African accepts lonans but considers that loans are repayable at the pleasure of the debtor. It is not unusual in htheir culture for a loan to be repaid by the son after the father's death. This clashes with our approach to loans and debts generally and leads to endless firction. Otherwise the irrigator tends to see the loans as government money and not his responsibility. He does not see it as his loss if a crop financed by government suffers through missing an irrigation, or through having fertilizer hidden under stover instead of applied to land or through failure to weed or reap betimes.[48]

The above is at best ignorance of the peasant farming system and at worst a grave misunderstanding of the peasant. The peasant farmer is capable of doing far much better if has access to credit facilities. The fact that the peasant has failed to repay his loans should not be looked at superficially. Favourable results of loans elsewhere in the world have depended on the presence of technology the peasant farmer make ready use of, as well as the presence of feeder farm to market road systems and favourable marketing and storage services and facilities to respond to increased production. When combined with such a comprehensive program, agricultural credit for the irrigators can be an important accelerator element.

> Whether viewed in the context of prevailing food grain shortages, or of the concern for small farmer and the reduction of poverty among the rural poor or of the new initiatives aimed at increasing the flow of investment for agricultural production in the developing countries agricultural credit might be considered not just timely but of urgent concern.[49]

With the advent of independence an urgent concern for credit for the irrigators and the peasant farmers in general has been shown. However, the credit has had some strings attached to it. For example the irrigator or the peasant can only qualify for loans if he grows crops that are marketed through statutory bodies like the Cotton Marketing Board or Grainmarketing Board. In practice this meant that the smallholder farmer has had access to credit at the expense of the freedomof choice of what to grow. Most of the crops that are marketed through statutory bodies are profitable when grown at large scale. The irrigation plotholders could make more money producing green mealies and vegetables which provide a source

of food in the local areas than say cotton. The other problem is that the peasant will get his cash crops to the market after having through quite a paraphanelia of problems.

Therefore, the lending policies of the Financial institutions still have to be adjusted to take coquisance of the structural problems that continue to besiege the peasant and s . his effort and initiatives.

Transport and Marketing Facilities

All the irrigation schemes in Masvingo are beset with transport problems. The major national roads have avoided these schemes. A good example is Manjinji irrigation scheme which is 227 km from Chiredzi. One has to travel such a long distance on poor gravel road. Only one bus gets to the scheme every two days. The bus acts as both a passenger service and goods service. But its roof luggage career cannot accommodate all the produce of the farmers. Therefore the incentive to produce for the distant market is effectively blocked and this inturn has adverse effects on the performance of the plot-holders. For one to get to Chilonga irrigation scheme, one has to cross Lundi River but there is no bridge across this river to link Chilonga with the nearest market centre Chiredzi yet its only about 24 km from Chiredzi. If one has to get there driving one has to go around a total of 90 km before getting to the scheme because of the absence of a bridge on the short route. This astronomically adds to transport costs. Both Musvuvugwa and Banga in Chibi have problems of transport which become acute during the rain season, when the poor gravel roads become slippery so much that they become impassible. People at Mushandike still have to walk about 10 km before they reach to the Masvingo - Beitbridge road. They do not have a bus service or a shopping centre nearby. Long distance buses normally do not pick them up because the scheme is about 30 km from Masvingo. To transport their produce to the market, they have to hire private transport operators who charge them exorbitantly.

Mapanzure scheme is near Ngundu halt and the plotholders transport their produce in scotch carts or on bicycle or by head. At Rupangwana the unscrupulous local businessman exploit the plotholders. They buy their produce at a very low price and then use their vehicles to transport the produce to Chiredzi and sell at very high prices. Such transport problems have not augured well for the Masvingo schemes.

Masvingo province has very few market centres of significance. The major ones are Masvingo, Chiredzi, Triangle, Mashava and Zvishavane. Therefore marketing of peasant produce is quite a problem. Most of the schemes rely on through traffic-buses loading and off loading passengers. Therefore local population forms the bulk of the market for the produce from the irrigation schemes. Mushandike is the only exception, which is run on commercial lines and the plot-holders sell their produce at the G M B in Masvingo. But still they have problems getting to Masvingo. They have to hire private transport operators and transport costs eat considerably into their profits.

Irrigated Agriculture : Debt or Profit?

Irrigation by smallholder schemes, have produced mixed results. In some cases the plot-holders have become evidently rich while in other cases plotholders have only managed to break even while others have actually recorded losses. To assess the profitability of the schemes, the author has considered the following:

a) Resources available to the household.
b) Non-agricultural activities traditional to the peasant farmer.
c) Size of the plot on the irrigation scheme and the size of the peasant's dryland holding.
d) Soil fertility and the availability of water.
e) A comparison of farmer who has only an irrigation plot and that who does not.

In most of the schemes studies, dryland cultivation actually subsidized the irrigation production. In very few cases did the author find irrigation production subsidizing dryland production. It was also evident that those families with the head out as migrant labour performed well because they had cash at their disposal to buy agricultural inputs such as fertilizer or hired labour when they needed it. Therefore one cannot acutally say that these people are profitably farming when in fact migrant wages are subsidizing farming operations thereby disguising loss as a profit since no records are kept on how much money from wages was sunk into farming?

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The other difficult the author came across in evaluating the production of the irrigation schemes is that presented by household consumption as well as evaluating labour costs provided by relatives who do not get paid or are paid in kind.

But the keynote in the operation of the schemes was found to be loss making rather than profit making.

CONCLUSION

The author found that for these schemes to become viable enterprises, a major structural change is called. First of all most of the schemes have to redesigned to allow equitable distribution of water while the plotsize has to be increased and plotholders should give up dryland holdings and become full time irrigators. The pricing policy of water must change to allow an efficient application of water and ensure that the benefits of water investment are not given away to the user without compensation.

Economic infrastructure of these schemes has to be overhauled as well. Good modern tarmarc roads must be constructed and proper marketing facilities assured. The introduction of such irrigation schemes characterised by high production may give rise to the collapse of the local markets for the irrigated commodity like maize or vegetables and wipe out its traditional producers outside the scheme. Irrigation schemes should by design be part of an overall regional development programmes and there should be market protection measures for the farming co
tties outside the schemes. In short there should be complimentary relation-
ship between programmes inside and outside the schemes.

FOOTNOTES

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7. J M Watermeyer op.cit p.36

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9. J M Watermeyer op cit p 36

10. Ibid p.38

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13. Ibid p.279

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20. A J B Hughes: Development in Rhodesian Tribal Areas. An overview p.185.

21. Ibid

22. R Palmer. The Agricultural History of Rhodesia in: Roots of Rural Poverty edited by R Palmer and Parsons p.221

23. Natural Region I : Categorized as specialized and deversified farming region. Rainfall in this region is high.

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Natural Region II. Categorized as intensive farming region. Rainfall is confined to summer andis moderately high.

Natural Region III Categorized as semi-intensive farming regions: Rainfall in this region is moderate in total but because most of it is accounted for by infrequent heavy falls and generally high temperatures, its effectiveness is reduced.

Natural Region IV Categorized as sermi - extensive farming region: This region experiences fairly low rainfall and is subject to periodic seasonal droughts and severe dry spells during the rainy season. The rainfall is too low uncertain for cash cropping except in a few favourable localities.

Natural Region V Categorized extensive farming region. The rainfall in this area is too low and erratic for the reliable production of even drought resistant fodder and grain crops and farming has to be based on the utilization of the veld alone.

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